EFFECT OF ABNORMAL WEATHER CONDITIONS DURING THE CONSTRUCTION OF THE LOS ANGELES AQUEDUCT, ABSTRACTED FROM REPORT OF THE ENGINEERS.

By ALEXANDER G. MCADIE, Professor U. S. Weather Bureau.

As might reasonably have been anticipated on construction work stretching over a distance of 213 miles, there have been many accidents, though most of them have been comparatively unimportant. In only two instances have substantial failures of work occurred, and these were due to extremely unusual weather conditions, and not to defects in plan, workmanship, or materials. In July, 1911, while constructing the concrete regulating gate in the aqueduct, just below the point of diversion from Owens River, the river reached a height unknown for more than 30 years before, probably on account of the melting of a large body of snow in the mountains. By reason of the uncompleted condition of the work and the greenness of the cement just placed, the flood waters broke under and around the gate and ran down the canal for about 5 miles, where they were turned out and flowed back into the river. As soon as the flood subsided the gate was replaced, and additional construction in the way of sheet-steel piling and concrete shut-off walls, suggested by the experience from the flood, was put in. The total amount of damage to the work hardly exceeded $1,000; the additional construction mentioned cost about $3,400.

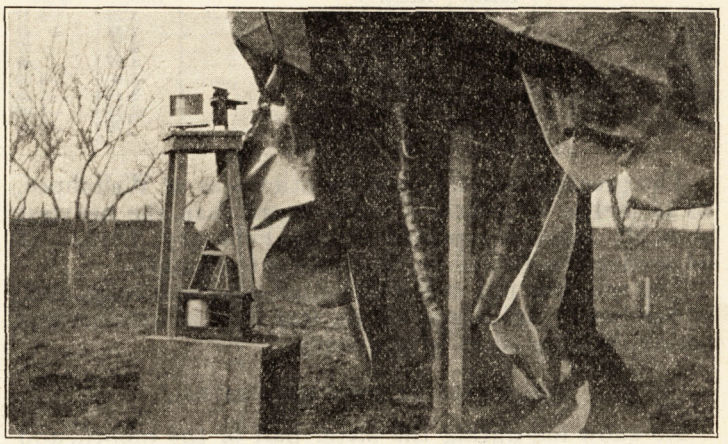
The other failure of work referred to occurred at the point where the aqueduct crosses what is known as "Tehachapi Wash," about 3 miles north of the town of Mojave. A section of conduit about 1,200 feet in length had been built across a delta composed of sand, gravel, and bowlders, which had been carried by flood waters from Tehachapi Canyon. As afterwards appeared, this material, though laid down by natural hydraulic process, had been left in an uncompacted condition, due to the rapid passage of the carrying agency. In the summer of 1910, after the construction of the section of conduit mentioned, a cloud-burst occurred in Tehachapi Canyon, resulting in a flood of water which ran down over the delta to the aqueduct work, where its passage was obstructed by the dump made by the steam shovels on the lower side of the trench. This caused the water to back up over the work to a depth of several feet, where it stood long enough to thoroughly saturate the ground around the conduit, and thus caused a subsidence of the formation. The concrete was cracked and fractured by this disturbance to an extent rendering it necessary to replace the work in the section mentioned, at a cost of $27,000. The cost of this reconstruction was somewhat excessive, due to the hardness and superior quality of the concrete, which required heavy blasting for its removal, holes being drilled in the corners of every 2 feet square and shot with dynamite. The broken concrete was then run through rock crushers and used as broken stone for the making of the concrete for the new line.

COVERING ALMOND TREES FOR FROST PROTECTION.

By ALEXANDER G. MCADIE, Professor U. S. Weather Bureau.

In previous papers on the subject of frost protection it was pointed out that one method of protection was by means of paper covers, a detailed account of which was given in the Pacific Rural Press of December 24, 1910. The argument advanced was that such a covering would intercept the long heat waves radiated from the earth on quiet, clear nights, and that there would be a certain absorption of the heat by the cover and a reemission. In brief, we could prevent a too rapid loss of heat by interference with free radiation, utilize the absorbed heat by reemission, and conserve the original heat supply of soil, tree, foliage, and the stratum of air within 15 feet of the ground.

The problem is a complicated one, as earth, tree, air, and water vapor gain and lose heat at varying rates. For the present we will neglect these points and give only



COVERED TREE WITH EXPOSED INSTRUMENTS ADJACENT.

the actual results of some experiments made during February and March, 1912, at the university farm at Davis, Cal.

Instructor B. S. Brown had direct charge of the experiments, being assisted by Emile Grauel, orchardist. The almond trees being in blossom, it was decided to cover

ALMOND TREE, SHOWING COVERING FOR TREE AND INSTRUMENTS INCLOSED.

one of them as shown in the illustration. The variety of the almond is the California Paper Shell. The paper used was a weatherproof manila and was first put on at 5 p. m. February 19, and removed at 9 a. m. February 21. It was again put on at 5 p. m. February 25, and removed